LONG TERM WASTE STRATEGY

Technical Memorandum No. 3
Options Identification and Evaluation Process

TORONTO

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1 Importance of Having a Waste Strategy

Waste management and diversion programs in the City of Toronto (the City) have evolved from simple garbage collection to a complex system of collecting source separated materials including Blue Bin materials, Green Bin organics, garbage, Oversized and Metal Items, Electronic Waste and Household Hazardous Waste, as well as a range of other items.

The most recent diversion plan approved by Toronto City Council in 2007, Target 70, outlined a strategy to achieve the goal of 70% diversion by 2010. The plan outlined a number of programs and initiatives including:

- source reduction initiatives;
- development of reuse centres;
- replacement of blue boxes with Blue Bins;
- addition of new recyclable materials;
- implementation of Green Bin organics programs for multi-residential buildings;
- education and enforcement of the City's diversion by-law;
- introduction of a volume-based rate structure;
- investigation of emerging source separation techniques; and,
- development of a residual waste processing facility to recover resources from mixed residual waste.

In 2013, Solid Waste Management Services (SWMS) presented a report to Public Works and Infrastructure Committee (PWIC), which provided a status update of the Target 70% initiatives; an explanation of why 70% diversion was not achieved. It also described plans for moving forward on diversion initiatives in 2013, including the development of a Long Term Waste Management Strategy.

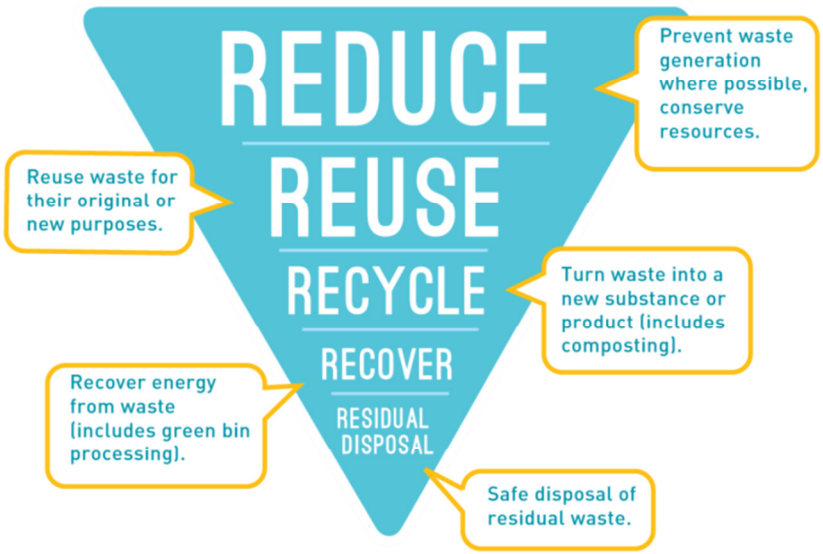
Recognizing the need for an updated comprehensive long-term waste management plan to set the foundation for future planning and coordinated decision making, the City of Toronto commissioned the development of a Long Term Waste Management Strategy in 2013[1].

The draft Long Term Waste Management Strategy (the draft Waste Strategy) recommends waste reduction, reuse, recycling, recovery and residual disposal (the 5Rs) (see Figure 1-1 below for a more complete description of the 5Rs) policies and programs that are cost-effective, socially acceptable and environmentally sustainable for the long

[1] http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW21.1

term. This is a "triple bottom line" approach that gives consideration to each component during the development of the draft Waste Strategy. The draft Waste Strategy anticipates the future needs of the City and identifies options to meet the needs for all of the City's customers.

Figure 1-1: 5Rs Waste Management Hierarchy



2 Developing the Waste Strategy

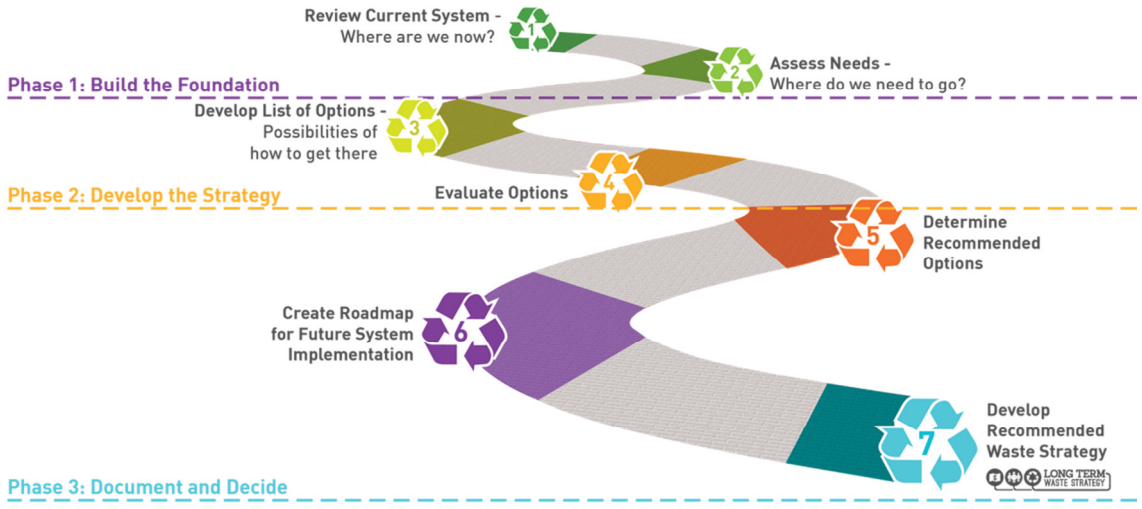
Development of a Long Term Waste Management Strategy is Strategic Action #7 in Council's 2013-2018 Strategic Action Plan. The Long Term Waste Management Strategy is to be developed in partnership with community and divisional stakeholders that are environmentally sustainable and economically viable. The intent of the draft Waste Strategy is to provide a high level decision making document to guide SWMS' policy decisions for the duration of the planning horizon of 30 to 50 years.

The development of the draft Waste Strategy has been governed by five guiding principles that were approved by City Council:

1. Consideration of options which support waste reduction, reuse, recycling and recovery before final disposal;
2. Consideration of all other environmentally approved disposal options to extend the life of Green Lane Landfill;
3. An open and transparent review of the options;
4. Innovation and flexibility to adapt to emerging technologies and changes to the regulatory environment; and,
5. Development of policies and opportunities for collaboration.

The draft Waste Strategy was prepared in three phases with each phase being supported by comprehensive consultation with the public, input from a stakeholder advisory group and key stakeholders including members of City Council. The overall draft Waste Strategy development process is presented in Figure 2-1 with a brief description of each phase of the draft Waste Strategy development process.

Figure 2-1: Waste Strategy Development Process



Phase 1 - BUILDING THE FOUNDATION

Building the foundation included establishing a comprehensive baseline to identify the current state of all aspects of the City's integrated waste management system and also identified the long-term need of the system in the future.

Deliverable 1 –"Where are we? Establishing a Comprehensive Baseline"
The purpose of this phase was to document the existing waste reduction, reuse, collection, transfer, processing, disposal and financial systems used to manage waste in the City. This baseline was used as the foundation upon which future programs, policies and facilities' recommendations are based. As part of the baseline, previous strategies that have been developed were taken into consideration, including outstanding recommendations for change such as development of a Mechanical Biological Treatment (MBT) facility. Phase 1 sets the baseline from which future options and recommendations were assessed in the Waste Strategy. The baseline has been documented in Technical Memorandum No. 1[2].

Deliverable 2 – "Where do we need to go? Identifying the Long-Term Needs"
Once a baseline had been established, projections for the future were developed in order to estimate requirements for waste management for the next 30 to 50 years. Variables that could impact the system including population growth, housing trends, economic growth, product design, packaging changes, City planning initiatives, and potential changes to legislation were reviewed in this phase. Technical Memorandum No. 2[3] documents the gaps, challenges and opportunities in Toronto's integrated waste management system. It includes projections for the future quantities of waste to be managed and the vision and guiding principles to guide the implementation of the Waste Strategy in the future.

Phase 2 - DEVELOP THE WASTE STRATEGY

In order to develop the draft Waste Strategy, a critical review of the current system was completed. This was done in order to identify areas of opportunity for improvement, as well as to consider policies, programs, and technologies that may help to improve the current system and provide for a stable long-term outlook. Where options were identified, they were critically evaluated and, where appropriate, recommended for implementation in the future.

Deliverable 3 – "How do we get there? Consideration of Options" (SUBJECT OF THIS DOCUMENT)

[2] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[3] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

A range of policies, programs, and facility/technology options were reviewed to identify options the City could consider in the future. Options included additional waste reduction and reuse programs and services, other waste diversion techniques and practices, renewable energy projects, waste technologies (e.g. Mixed Waste Processing (MWP)), Energy from Waste (EFW), alternative disposal options (e.g. redirecting waste to other landfills), and long-term opportunities for Green Lane Landfill. Where appropriate, separate options were identified to manage waste from the single family and multi-residential sectors since these two sectors have different waste management needs and in some cases may require different programs and infrastructure. Technical Memorandum No. 3 identifies and discusses a list of options available to the City and describes the evaluation methodology and criteria used to evaluate each option.

Deliverable 4 – "Evaluate the possibilities. Identifying the Best Options for the City"
During this phase, a detailed evaluation of the options identified in Phase 2 will be conducted from an environmental, social and financial perspective to identify a series of recommended long-term options for the City. Technical Memorandum No. 4 will document the evaluation process and resulting recommended options for the City.

Phase 3 – DOCUMENT AND DECIDE

Once the recommendations for change have been determined, a draft Waste Strategy document will be prepared to identify what the new system will look like, the timing for any proposed changes, the financial requirements to support the new system and the roles and responsibilities of all those involved.

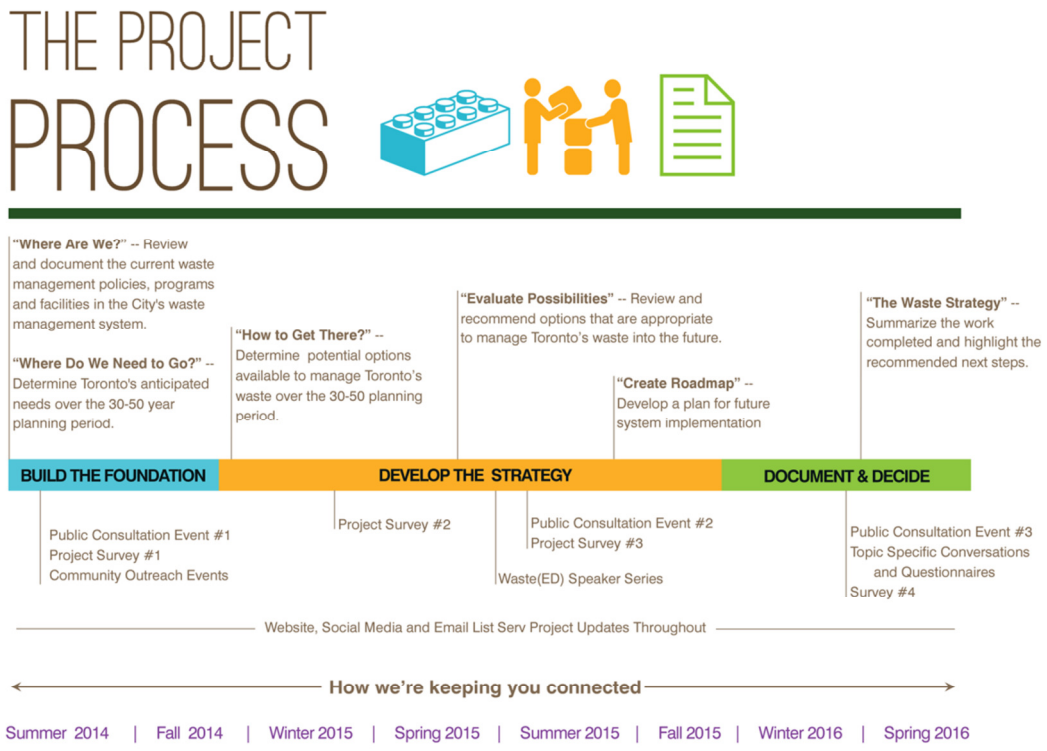
Deliverable 5 – "Prepare and draft the Long Term Waste Management Strategy document"
The Draft Waste Strategy will be developed using the results of the evaluation process. It will include an implementation "roadmap" to help guide the City's integrated waste management system for the next 30 to 50 years. The final Waste Strategy will also include a consultation report documenting the consultation report documenting the consultation activities conducted and feedback received during development of the Waste Strategy. Reports on consultation completed to date can be found on the City's website[4].

In parallel to the completion of the three phases, a comprehensive consultation plan has been, and will continue to be, implemented to present information, solicit feedback, and provide an opportunity for the community to help guide the development of their future waste management system. Throughout the process, City staff will provide regular updates to PWIC on the development of the Waste Strategy.

[4] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

The following Figure 2-2 shows how the consultation plan developed for the Waste Strategy will be incorporated into the three phases described above.

Figure 2-2: The Project Process



3 A Vision for the Future & Guiding Principles

A successful Waste Strategy reflects the interests of the community that it serves now and in the future. It is driven by a Vision Statement and Guiding Principles that express a philosophy of what the Waste Strategy will strive to achieve and what will be important in making decisions along the way. The following provides an overview of the approved[5] Vision and Guiding principles for the Waste Strategy.

Further information on the feedback received on the Vision and Guiding Principles during the consultation process can be found in the Phase 2 Consultation Summary[6].

3.1 A Vision for the Future

The Draft Vision Statement for the Waste Strategy was developed through a combination of feedback received during the Phase 1 public consultation events in June 2014, a visioning session with Stakeholder Advisory Group members, and a visioning session with members of the SWMS' Senior Management Team. The resulting draft themes for the Vision Statement were presented to the public in a survey (Survey No. 2) in Phase 2 of the consultation process.

Based on the feedback received during the consultation and engagement period, a final Vision Statement was prepared and approved by City Council in October 2015:

> "*Together we will reduce the amount of waste we generate, reuse what we can, and recycle and recover the remaining resources to reinvest back into the economy. We will embrace a waste management system that is user-friendly, with programs and facilities that balance the needs of the community and the environment with long-term financial sustainability. Together, we will ensure a safe, clean, beautiful and healthy City for the future.*"

3.2 Guiding Principles to Stay on Track

The Phase 2 consultation process also presented a list of Guiding Principles. Consultation participants were asked to identify one or more Guiding Principles that were most important to them.

The top three Guiding Principles selected by participants were:

- Work to Mitigate Climate Change;
- Treat Waste as a Resource; and
- Prioritize our Community's Health & Environment.

[5] http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW7.3
[6] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

Through the consultation process, there were no comments received in opposition to any of the guiding principles, nor were there suggestions that would support removing some from the list. City Council approved in October 2015 the following original list of eight Guiding Principles to support decision making and to guide the implementation of the Waste Strategy in the future:

- **Work to Mitigate Climate Change Impacts**- To reduce our impact on climate change we will find solutions that reduce greenhouse gas emissions associated with our waste management system.
- **Treat Waste as a Resource**- Waste is an asset that needs to be conserved. We should make best use of our waste by recovering materials and energy remaining after reducing, reusing, and recycling.
- **Prioritize our Community's Health and Environment**- The health of our residents and the environment is a priority in decision making to minimize negative impacts and to maximize the benefits.
- **Embrace Social Equity**- Create an easy-to-use system that all residents and the community can understand and participate in.
- **Lead the Change**- Strong leadership is taking ownership, leading by action and being responsible for the waste we produce.
- **Ensure Financial Sustainability**- Financially sustainable solutions that are easy and affordable to maintain by future generations and also help to stimulate economic growth within our community.
- **Make the Future System Transparent**- Future decisions on the implementation of the Waste Strategy will be open, accessible and based on best practices and facts to find solutions that benefit all.
- **Support Development of Community Partnerships**- Working together with local community groups and organizations will help us reach our goals and reduce waste more effectively and efficiently.

4 Gaps, Challenges and/or Opportunities

The gaps, challenges and/or opportunities include those components of the system that are either being currently experienced, or will likely be experienced in the future, or an ability for enhancement and/or need of improvement in the future. These gaps, challenges and/or opportunities were identified through a combination of stakeholder consultations, City staff review and input, a jurisdictional review of other similar systems, and the expertise of the consultant team.

This assessment also helped to focus the options identification process to ensure it included areas where gaps, challenges, and/or opportunities do or are anticipated to exist in the future.

A total of 19 primary gaps, challenges and/or opportunities have been identified and are listed in Table 4-1 below (in no particular order of priority or importance). Seventeen gaps, challenges and/or opportunities were originally presented to PWIC and City Council in September/October 2015. Subsequent to these meetings, two (2) additional gaps, challenges, and/or opportunities were identified and have been noted as "New" in the table below. These gaps, challenges and/or opportunities were categorized as either "Programmatic", "Facilities/Infrastructure" or "Internal & External Influences/Pressures" to assist with the evaluation in later stages of the Waste Strategy development process.

Table 4-1: Identified Gaps, Challenges and/or Opportunities

Gap, Challenge and/or Opportunity	Summary of Challenge
Waste Reduction & Reuse	A challenge facing the City is how to better promote and facilitate the reduction and reuse of waste materials to prevent waste from entering the system and requiring management through collection, processing and/or disposal.
Dufferin Waste Management Facility	The City has a Material Recycling Facility that closed in November 2014 with no current long-term plan for its future use. A challenge facing the City is to examine the function and role of the entire Dufferin Waste Management Facility to identify future roles within the City's integrated solid waste management system.
Multi-residential Waste Diversion	A challenge facing the City is the need for increased waste diversion in the multi-residential sector to support its diversion goals, and reduce the amount of material currently being landfilled.

Gap, Challenge and/or Opportunity	Summary of Challenge
Performance Measures	A challenge facing the City is having a robust group of performance metrics that will accurately measure the waste management system performance and account for changing waste streams, composition, community demographics, etc.
Public Education and Engagement	A challenge facing the City is being able to reach out to a diverse community to educate its customers on program changes, good waste management practices, and where possible, how to better reduce and reuse.
Regulatory, Control and Role/ Responsibility Challenges	A challenge facing the City is having a system where some waste management responsibilities are outside of the City's control and therefore subject to uncertainty and risk with respect to external parties making changes that can impact the City's system.
Residual Waste Disposal Capacity	A challenge facing the City is to extend the life of Green Lane Landfill and find new waste disposal options to cover the disposal needs for the 30 to 50 year planning period of the Waste Strategy.
Solid Waste Services for the Institutional, Commercial &Industrial (IC&I) Sector	A challenge facing the City is trying to find a mechanism to allow the City to influence greater waste diversion in the IC&I sector for waste materials being generated within the City of Toronto, but managed outside the City of Toronto waste management system. A challenge facing the City is to provide the IC&I sector with options which promote greater diversion and are flexible to accommodate changing waste streams and customer accessibility.
Commissioners Street Transfer Station	A challenge facing the City is the decision needed about the future of the Commissioners Transfer Station (TS); whether it should be relocated or closed. If the facility is relocated, there are options to construct a new facility that may or may not include a residential drop-off facility. If the facility is closed, the City will need to decide how the current services available at the Commissioners TS will be replaced.
Future Role of and Need for Drop-off Facilities	A challenge facing the City is to provide its customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and resident accessibility.

Gap, Challenge and/or Opportunity	Summary of Challenge
Value of Food and Food Waste	A challenge facing the City is the need to reduce waste through 1) decreasing the amount of food that is being wasted, and 2) increasing the amount of food waste that is being captured for diversion.
Waste Financing System	A challenge facing the City is the development of a sustainable financing strategy that will allow the City to move toward greater waste diversion while balancing program sustainability and in support of the need for long-term infrastructure investments. This sustainable waste financing strategy needs to be specific to waste such that revenues collected and reserve funds established need to be used only for future waste management related expenditures.
Waste Recovery Technologies	A challenge the City is facing is diminishing landfill disposal capacity. Alternative processing technologies could divert additional materials from disposal and extend the life of Green Lane Landfill.
Future Waste Processing Capacity	A challenge facing the City is to maximize the use of its facilities and infrastructure, in particular waste processing capacity, and maintain sufficient capacity in the system to address its future demands.
Impacts of Energy Costs on the Waste Management System	A challenge facing the City is that the system is heavily dependent on energy, in particular for the collection of waste, and energy costs are expected to continue to increase in the future.
Impacts of Intensification	A challenge facing the City is the impacts of intensification and the changes required to manage additional waste generated by multi-residential housing units with typically lower waste diversion performance records and in areas that are more difficult to collect using traditional methods.
Impacts of a Changing Waste Stream	A challenge facing the City is the constant changing of the waste stream and the ability for programs and infrastructure to adapt.

Gap, Challenge and/or Opportunity	Summary of Challenge
Solid Waste Services for the Construction, Renovation and Demolition (CRD) Sector (*New)	A challenge facing the City is to address residential renovation waste and provide its renovator customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and accessibility. An additional challenge facing the City is how to better promote and facilitate diversion of CRD materials generated by the CRD sector, which comprises up to 40% of the total waste stream generated in the City.
Enhanced Enforcement Opportunities (*New)	A challenge for the City is to maximize the effective and efficient use of its current programs, services and facilities. To date, significant effort and success has been realized through promotion and education; however, there are still areas of the system where voluntary compliance is not at the desired level, requiring strategic consideration of mandatory measures.

A detailed discussion of the Gaps, Challenges and Opportunities can be found in Technical Memorandum No. 2[7].

[7] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

5 Waste Projections Development

As is evident in a number of the Gaps, Challenges and/or Opportunities, the growth of the City in the future presents both challenges and opportunities for the future system. As part of the development of the Waste Strategy, estimates of the future quantities of waste requiring management were calculated based on economic indicators and population projections. A number of factors can influence waste generation and result in an incline or decline in waste tonnages requiring management, including:

1. Lightweighting[8] of packaging;
2. Change in number of customers serviced by the City;
3. Waste reduction and reuse activities;
4. Economic factors; and,
5. Seasonal/Natural events (e.g., flooding, ice storms, etc.).

A detailed discussion of the projections can be found Technical Memorandum No. 2[9] as well as a number of key findings including the following;

1. In order to develop a model to forecast waste generation, economic indicators needed to be established that could be correlated with waste generation data. The trends between quarterly residential waste generation, Gross Domestic Product (GDP) and population were found to be statistically significant[10]. Some aspects of the downward trend in waste generation noted from 2001 to 2009 are consistent with what has been found in other cities across Canada and the US, and are related to changing lifestyles and other trends, which have been on-going in the economy and also in residential waste generation since 2001.
2. Since the recent data series is less than five years long, it is insufficient for producing long-term forecasts. It is recommended that at least 10 years of observations be collected (ideally without structural breaks) for long-term forecasting purposes. As more observations are collected, the recent data series model can be updated and eventually be the sole model for forecasting waste generation.
3. A series of quarterly waste projections by stream from 2014 to 2021 were developed for a variety of scenarios. These scenarios can be updated with new values for economic indicators and quarterly tonnage data. The City has the opportunity to develop predictive models, which can forecast near term waste generation on a monthly basis. Long-term monthly forecasts can only be produced if monthly economic indicators are forecasted on a long-term basis (more than five years into the future). Relationships between monthly waste generation and monthly economic indicators

[8] Refers to the trend of manufacturing containers such as as plastic water bottles and metal containers which are lighter with thinner walls.
[9] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[10] Statistically significant: There is confidence at the 95 percent level that observed trends between tonnage and the economic indicators are real and not due to random fluctuations. Because of this confidence models can be used to predict tonnage.

using the recent data series were also explored. The strongest relationship was found to be between monthly waste generation and monthly city residential building permits. This knowledge can be used to possibly build a "near-term" prediction model, which can predict the amount of waste generated in the upcoming months.

4. It is estimated that by the end of the planning period, the City could be managing over 1.5 million tonnes annually of material generated by the City's customers.
5. With the implementation of the recommended series of new waste reduction, reuse, recycling, recovery and residual programs and facilities as part of the draft Waste Strategy, the life of Green Lane Landfill could be extended to at least 2040.
6. Based on the projections developed for quantities of Blue Bin materials, and barring any changes to the current system, it appears that there is sufficient capacity for the amount of Blue Bin materials collected until the end of the contract period in 2022. Based on the projections developed for tonnages of Green Bin materials requiring management, it is anticipated that the City will require additional processing capacity after 2020 when current contracts with private sector facilities expire.

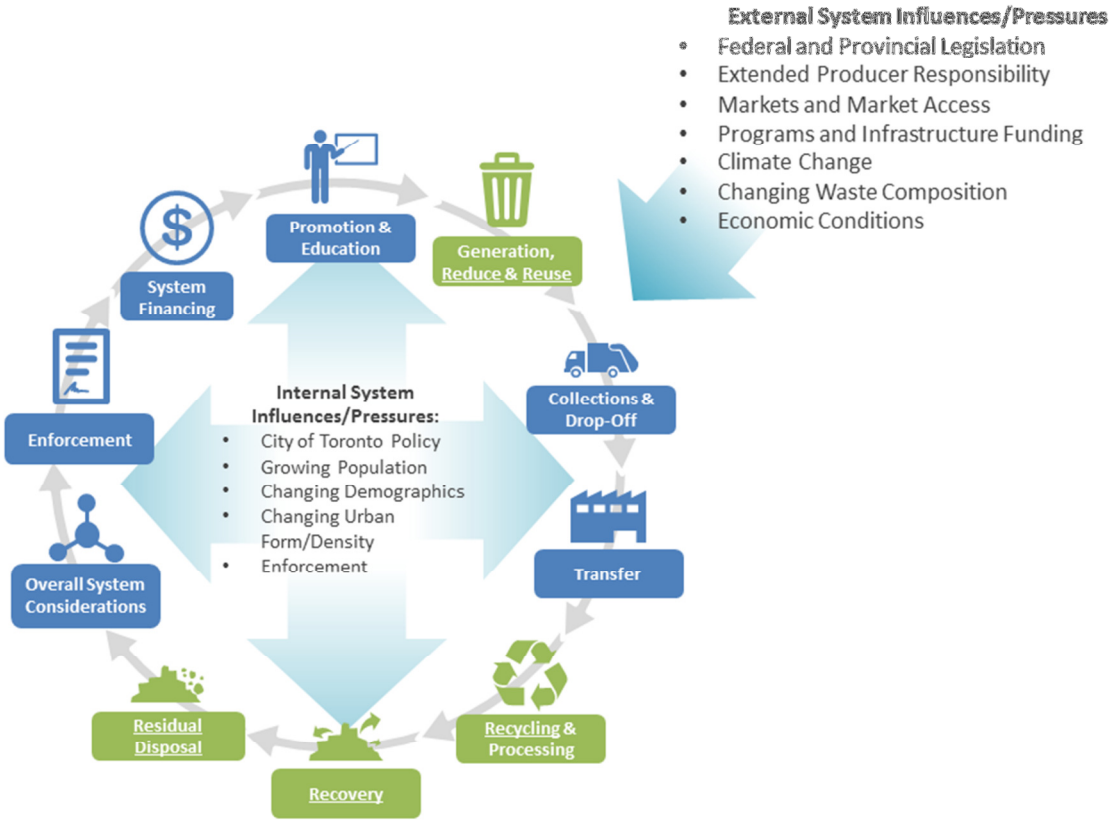
6 Purpose of this Technical Memorandum

Waste management systems are large, complex entities with a number of potential programs, initiatives, technologies, and approaches that can be applied to them. Step 3 identifies the list of options that will be evaluated covering the full range of the waste management hierarchy (5Rs-–Reduction, Reuse, Recycling, Recovery, and Residual Disposal). This technical memorandum documents the results of Step 3 as described in the section above and outlines the identification and development of options and the detailed evaluation process and criteria. The list of potential options identified has been developed through a combination of research, stakeholder consultation, experience of the project team and a jurisdictional review of other municipalities. This list of identified options is consistent with the Waste Strategy's Vision and Guiding Principles. It is important that any option being considered in the detailed evaluation (Step 4) is both consistent with the long-term Vision and does not conflict with any of the underlying Guiding Principles developed in Step 2.

7 Identification and Development of Options

As part of the development of the Waste Strategy, a list of policy and technological options and solutions to address Toronto's waste management needs (see Technical Memorandum No. 2) for the next 30 to 50 years was created (see Table 7-1). City staff and consultants structured the options based on an integrated systems approach that follows the flow of waste from generation to final disposal. This approach highlights the 5Rs hierarchy (with an emphasis on Reduction, Reuse and Recycling) and mirrors aspects of a circular economy or cradle-to-cradle approach. It also identifies internal and external influences on the system, such as City of Toronto policies or Provincial legislation. Figure 7-1 below presents a graphical representation of the integrated systems approach.

Figure 7-1: Components of the System and Potential Influences



A preliminary list of options was presented to the public and stakeholders in June 2015. Based on the feedback received, the list of options was revised and extended to include new options brought forth. No options were removed from the list. A new set of options to address Construction, Renovation and Demolition waste was added at the request of City Council at their October 2015 meeting.

The following Table 7-1 provides a summary of the list of options being considered, which have been deemed consistent with the long-term Vision and Guiding Principles for the Waste Strategy.

Options have been grouped together to address a common gap, challenge and/or opportunity and were evaluated using the criteria outlined below to determine suitability for Toronto. There are three sets of options under consideration: programmatic; facility/infrastructure; and implementation tools/future considerations. The following provides an overview of the broadly defined classification of options:

- Option Type #1: Programmatic (P)
  This type of option typically involves activities that are more policy and behaviour related with minimal capital investment required for infrastructure. Examples of Programmatic Change Options can include, but are not limited to, advocacy, regulatory changes, waste financing system, reduction and reuse initiatives, and cultural and behavioural changes (e.g. food waste).

- Option Type #2: Facility/Infrastructure (F/I)
  This type of option includes infrastructure activities, such as adding a new facility or making modifications to the current facility network. Examples of this type of option include, but are not limited to, drop-off facilities, waste recovery technologies, residual waste disposal capacity, partnerships or contracting out of services identified (if infrastructure already exists).

- Option Type #3: Implementation Tools/Future Considerations (IT or FC)
  Some of the options identified will not be evaluated using the criteria below, but rather will be identified as Implementation Tools or Future Considerations. Implementation tools are options that will be considered in the context of what is recommended for implementation (e.g. an Implementation Tool option will be utilized to support the implementation of a recommended program or facility). Future considerations are options that would not be initially required and timing for a more detailed evaluation of the option will be identified (e.g. a decision on future processing capacity needs to be deferred to a more appropriate time in the future, once the implementation impact of recommended programs and facilities is better understood).

Table 7-1: List of Options, Classification and Gap, Challenge and/or Opportunity

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Promotion & Education		
Option 1.1: Interactive Online Waste Management Tool.	IT	• Public Education and Engagement
Option 1.2: Environmental Impacts Calculator.	IT	• Public Education and Engagement
Option 1.3: Expand Social Media Presence.	IT	• Public Education and Engagement
Option 1.4: Provide Additional Tools and/or Resources to the 3Rs Ambassadors and Other Volunteer Programs.	IT	• Public Education and Engagement
Option 1.5: Incentivizing 3Rs Ambassadors and Other Volunteer Programs.	IT	• Public Education and Engagement
Option 1.6: Targeted Group Communications.	IT	• Public Education and Engagement
Option 1.7: Multi-residential – Workshops and Other Outreach for Buildings Not Receiving City Waste Collection Services.	IT	• Public Education and Engagement • Multi-residential Waste Diversion
Option 1.8. Mandatory Multi-residential By-law.	P	• Multi-residential Waste Diversion • Enhanced Enforcement Opportunities • Regulatory, Control and Role/Responsibility Challenges
Option 1.9. Updates to Current Multi-residential Development Standards.	P	• Multi-residential Waste Diversion • Enhanced Enforcement Opportunities • Impacts of Energy Costs on the Waste Management System • Regulatory, Control and Role/Responsibility Challenges
Option 1.10: Community Partnership Unit Within Solid Waste Management Services (SWMS) Division.	IT	• Public Education and Engagement

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Generation, Reduce & Reuse		
Option 2.1: Outreach and Education Campaign to Reduce Waste.	IT	• Public Education and Engagement
Option 2.2: Food Waste Reduction Strategy.	P	• Waste Reduction & Reuse • Value of Food and Food Waste
Option 2.3: Textile Collection and Reuse Strategy.	P	• Waste Reduction & Reuse
Option 2.4: Sharing Library.	P	• Waste Reduction & Reuse
Option 2.5: Support Reuse Events.	P	• Waste Reduction & Reuse
Option 2.6: Explore Opportunities for Waste Exchange.	P	• Waste Reduction & Reuse
Option 2.7: Community/Mid-Scale Composting.	P	• Waste Reduction & Reuse • Value of Food and Food Waste • Multi-residential Waste Diversion
Collection & Drop-off		
Option 3.1: Container management.	P	• Multi-residential Waste Diversion • Performance Measures • Impacts of Energy Costs on the Waste Management System
Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - Coloured bags	F/I	• Multi-residential Waste Diversion • Impacts of Intensification • Impacts of Energy Costs on the Waste Management System
Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum	F/I	• Multi-residential Waste Diversion • Impacts of Intensification • Impacts of Energy Costs on the Waste Management System

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 3.3: Stand Alone Drop-off and Reuse Centres.	F/I	• Drop-off Facilities • Impacts of a Changing Waste Stream • Impacts of Intensification • Waste Reduction & Reuse
Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Diversion Stations in Convenient Locations.	F/I	• Drop-off Facilities • Impacts of a Changing Waste Stream • Impacts of Intensification • Waste Reduction & Reuse
Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials.	F/I	• Drop-off Facilities • Impacts of a Changing Waste Stream • Impacts of Intensification • Waste Reduction & Reuse
Option 3.6: Incentive Based Drop-off System (e.g. reverse vending machines).	P	• Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges
Option 3.7: Multi-residential Collection using Alternative Vehicles.	F/I	• Multi-residential Waste Diversion • Impacts of Intensification • Impacts of Energy Costs on the Waste Management System
Transfer		
Option 4.1: Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.	F/I	• Transfer Station at Commissioners St. • Impacts of Intensification • Drop-off Facilities
Option 4.2: Redirecting Waste to an Existing Transfer Station(s).	F/I	• Transfer Station at Commissioners St. Impacts of Intensification • Drop-off Facilities

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available).	F/I	• Transfer Station at Commissioners St. • Impacts of Intensification • Drop-off Facilities
Recycling & Processing		
Option 5.1: On-site Organics Processing.	P	• Waste Reduction & Reuse • Value of Food and Food Waste • Multi-residential Waste Diversion
Option 5.2: In-Sink Disposal Units.	P	• Multi-residential Waste Diversion • Impacts of Energy Costs on the Waste Management System
Option 5.3: Future Blue Bin Processing Capacity	FC	• Future Waste Processing Capacity
Option 5.4: Future Green Bin processing capacity	FC	• Future Waste Processing Capacity
Option 5.5: Future Materials Recycling and Other Reuse Related Processing	FC	• Future Waste Processing Capacity
Option 5.6: Dufferin Waste Management Facility.	FC	• Dufferin Waste Management Facility • Multi-residential Waste Diversion • Waste Recovery Technologies
Waste Recovery Technologies		
Option 6.1: Mixed Waste Processing Facility Development.	F/I	• Waste Recovery Technologies • Multi-residential Waste Diversion • Impacts of Energy Costs on the Waste Management System
Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development.	F/I	• Waste Recovery Technologies • Multi-residential Waste Diversion • Impacts of Energy Costs on the Waste Management System

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 6.3: Direct Combustion Facility Development.	F/I	• Waste Recovery Technologies • Impacts of Energy Costs on the Waste Management System
Option 6.4: Emerging Technologies Facility Development.	F/I	• Waste Recovery Technologies • Impacts of Energy Costs on the Waste Management System
Option 6.5: Organics Recycling Biocell or Biomodule.	F/I	• Waste Recovery Technologies • Multi-residential Waste Diversion • Impacts of Energy Costs on the Waste Management System
Option 6.6: Refuse Derived Fuel Facility Development.	F/I	• Waste Recovery Technologies • Impacts of Energy Costs on the Waste Management System
Option 6.7: Waste to Liquid Fuel Technologies Facility Development.	F/I	• Waste Recovery Technologies • Impacts of Energy Costs on the Waste Management System
Residual Waste Disposal Capacity		
Option 7.1: Landfill Expansion.	F/I	• Residual Waste Disposal Capacity
Option 7.2: Landfill Mining and Reclamation.	FC	• Waste Recovery Technologies • Impacts of Intensification
Option 7.3: Bio-reactor Landfill.	F/I	• Residual Waste Disposal Capacity • Impacts of Energy Costs on the Waste Management System
Option 7.4: Landfill Operation Continuous Improvement and Best Practices.	FC	• Residual Waste Disposal Capacity
Option 7.5: Adjust Tipping Fees or Customer Base.	F/I	• Residual Waste Disposal Capacity
Option 7.6: Purchase a New Landfill.	F/I	• Residual Waste Disposal Capacity
Option 7.7a: Securing disposal capacity to preserve long-term landfill capacity at GLL.	F/I	• Residual Waste Disposal Capacity

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 7.7b: Securing disposal capacity for residual management following GLL reaching its approved disposal capacity.	F/I	• Residual Waste Disposal Capacity
Option 7.8: Greenfield Landfill.	F/I	• Residual Waste Disposal Capacity
System Financing		
Option 8.1: Fully Independent Utility with No Rebate Program.	IT	• Waste Financing System
Option 8.2: Public-Private Partnerships ("P3") for Major Capital Works.	IT	• Waste Financing System
Option 8.3: Debt Financing.	IT	• Waste Financing System
Option 8.4: Increase Solid Waste Management Services Customer Base.	IT	• Waste Financing System
Option 8.5: Allocating Costs for Waste Management to Applicable Waste Streams.	IT	• Waste Financing System
Option 8.6: Alternative Revenue Generation Opportunities.	IT	• Waste Financing System
Option 8.7: Performance Based Incentives.	IT	• Waste Financing System • Performance Measures • Multi-residential Waste Diversion
Overall System Considerations		
Option 9.1: Elimination of Collection Service to Multi-residential Buildings.	P	• Multi-residential Waste Diversion • Regulatory, Control and Role/Responsibility Challenges
Option 9.2: Coordinated and/or Alternative Contracts	IT	• Impacts of a Changing Waste Stream • Impacts of Intensification • Impacts of Energy Costs on the Waste Management System

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market To Provide Diversion Opportunities to More Commercial Businesses in City of Toronto	P	• Solid Waste Services for the IC&I Sector • Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges
Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion	P	• Solid Waste Services for the IC&I Sector • Impacts of a Changing Waste Stream • Regulatory, Control and Role/ • Responsibility Challenges • Enhanced Enforcement Opportunities
Option 9.5: City of Toronto Exits the IC&I Waste Management Service.	P	• Solid Waste Services for the IC&I Sector • Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges
Option 9.6: City to Assume Role of Facilitator to Encourage Industrial, Commercial and Institutional Waste Diversion.	IT	• Public Education and Engagement
Option 9.7: City Explores Mechanisms to Introduce Additional Controls Over Waste Management.	P	• Regulatory, Control and Role/Responsibility Challenges • Public Education and Engagement
Option 9.8: Deposit-return System for City of Toronto for Selected Materials.	P	• Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges
Option 9.9: Expanded Blue Bin/Printed Paper and Packaging, Expanded Producer Responsibility Options and Potential Impacts for Toronto.	FC	• Regulatory, Control and Role/Responsibility Challenges
Option 9.10: Develop an Advocacy Strategy.	IT	• Public Education and Engagement
Option 9.11: Green Procurement.	IT	• Regulatory, Control and Role/Responsibility Challenges

Option	Classification	Gap, Challenge and/or Opportunity
P = Program, F/I = Facilities/Infrastructure, IT = Implementation Tool, FC = Future Consideration		
Option 9.12: Performance Measures to Define Success and Shape the Future of Waste Management.	IT	• Performance Measures
Option 9.13: Research, Development, and Innovation Unit	IT	• Public Education and Engagement • Impacts of a Changing Waste Stream • Impacts of Energy Costs on the Waste Management System • Multi-residential Waste Diversion • Impacts of Intensification
Option 9.14: Establish a Circular Economy/Waste Reduction Committee to Inform On-going Waste Planning/Implementation Process.	IT	• Public Education and Engagement
Option 10.1: Depots, Processing, and Policies to Divert CRD Waste	F/I	• Solid Waste Services for the CRD Sector • Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges • Enhanced Enforcement Opportunities
Option 10.2: CRD Material Disposal Ban.	P	• Solid Waste Services for the CRD Sector • Impacts of a Changing Waste Stream • Regulatory, Control and Role/Responsibility Challenges • Enhanced Enforcement Opportunities

For each of the options identified above, full descriptions were developed including: a summary; City of Toronto Experience; Municipal/Waste Industry Experience; Case Studies/Examples; Considerations; and Potential Outcomes. These descriptions can be found in **Appendix A**.

8 Detailed Evaluation Process and Criteria

A successful Waste Strategy reflects the interests of the community that it serves now and in the future. It is driven by a Vision Statement and Guiding Principles that express a philosophy of what the Waste Strategy will strive to achieve. It is also supported by a review and evaluation of potential options for the future that reflects what is important to the community.

In order to ensure the evaluation process was acceptable to the community and its many stakeholders, the 'triple-bottom line' evaluation process was presented in Phase 2 consultation and feedback was sought on the proposed evaluation criteria. This process included input from residents, stakeholders, business and industry representatives, and City staff. A number of engagement and consultation activities were designed to solicit feedback on the draft evaluation criteria and priorities. These events and meetings included:

- Stakeholder Advisory Group Meetings;
- Key Stakeholder Meetings;
- Public Consultation Events (PCEs) – June 9, 15, 20, and 24, 2015; and,
- Survey #3 on the Criteria, Priorities, and Options for Consideration.

The Phase 2 Consultation Summary Report includes a more detailed description of the input received regarding the draft evaluation process and criteria from each of these groups and events.

The following provides an overview of the evaluation process and criteria to be applied to each of the options. In accordance with Step 4 – Detailed Evaluation of Options, as described in the overall Waste Strategy development process, this section documents:

1. The evaluation process to be utilized to compare and contrast the options identified to address either:
    a) a current system gap and/or challenge;
    b) a gap and/or challenge identified in the future; or,
    c) an opportunity to enhance what is already being done.[11]
2. The detailed evaluation criteria to be applied in the evaluation; and,
3. The overall priority applied to criteria.

The process and criteria identified below have been developed to reflect the draft Vision and Guiding Principles set out for the Waste Strategy and have been revised where appropriate to reflect input received during the Phase 2 consultation process.

[11] For a complete listing of Gaps, Challenges and Opportunities, refer to HDR Technical Memorandum No. 2 -- Needs Assessment: Gaps & Challenges, Vision and Principles, Projections Development..

8.1 Evaluation Process

The evaluation of potential options will follow a four-phase approach that will use both qualitative and quantitative data where available.

There are different methods (qualitative, quantitative or a combination of both) that will be used to evaluate the options. There is no legislated requirement to apply any specific methodology as it relates to developing a waste strategy, however, the process should be open and transparent, traceable and replicable and should consider the relative advantages and disadvantages based on a net effects analysis[12] of options. This type of methodology is commonly applied in more stringent alternatives analysis such as those undertaken to address the approval requirements of the Ontario Environmental Assessment Act. However, it is important to note that a fundamental difference between the evaluation process in a long-term strategy such as this and an Environmental Assessment (EA) is that in an EA, the range of options is much more focused which subsequently allows for a more focused evaluation. The development of the Waste Strategy provides an overall plan for the future, some options that could be recommended will require more detailed evaluation as part of the completion of an EA as an outcome of this Waste Strategy.

8.1.1 Phase 1: Background Data Collection.

Data collection for each option is undertaken so that they can be evaluated. For example, in order to evaluate the relative cost implications of each option, background research is required to develop the cost estimates for each option.

8.1.2 Phase 2: Grouping of Similar Options.

For evaluation purposes, similar options that could address specific gaps and or challenges were grouped together into the following categories: Generation, Reduction and Reuse, Collection & Drop-off Depots; Commissioners Street Transfer Station; Materials & Energy Recovery (new facilities); Residual Waste Disposal; Multi-residential; Industrial, Commercial & Institutional (IC&I); Construction, Renovation, Demolition (CRD); Control, Influence & Enforcement; and Incentive Based Mechanisms. These categories were also important as they reflect the various components of the integrated waste management system (see Figure 7-1 above). Within each category, like options were comparatively evaluated to determine the recommended options.

Some of the options identified will not be evaluated using the criteria below, but rather will be identified as Future Considerations or Implementation Tools. These options will be considered in the context of what is recommended for implementation. For instance, an Implementation Tool option will be utilized to support the implementation of a recommended program or facility. Future Considerations may require a more detailed evaluation at some point in the future. For example, future processing capacity needs to be considered where there is already capacity in the system for the foreseeable future, and a recommendation on how to proceed is best

[12] A net effects analysis considers the potential effects of a new option taking into account the assumed use of reasonable mitigation measures. For example, a landfill could have a significant impact on groundwater if it isn't properly designed and operated, however, in a net effects analysis, it is assumed that the site would be properly designed and operated to mitigate potential impacts and therefore the evaluation of a new landfill is based on the "net effects".

deferred to a more appropriate time in the future once the impact of recommended programs and facilities is better understood following their implementation.

Table 7-1 presented the full list of options that were identified to address the City's gaps, challenges and/or opportunities. As described above, many of the options were classified as Future Considerations or Implementation Tools. These options will not undergo evaluation as they have no direct environmental, social or economic impact; only those options classified as Programs or Facilities/Infrastructure will undergo evaluation.

The following table presents the options that will undergo evaluation.

Table 8-1: Options undergoing Evaluation

System Component	Option Undergoing Evaluation
Generation, Reduction and Reuse	Option 2.2: Food Waste Reduction Strategy.
	Option 2.3: Textile Collection and Reuse Strategy.
	Option 2.4: Sharing Library.
	Option 2.5: Support Reuse Events.
	Option 2.6: Explore Opportunities for Waste Exchange.
Collection & Drop-off Depots	Option 3.3: Stand Alone Drop-off and Reuse Centres.
	Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Diversion Stations in Convenient Locations.
	Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials.
Commissioners Street Transfer Station	Option 4.1: Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.
	Option 4.2: Redirecting Waste to an Existing Transfer Station(s).
	Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available).
Materials & Energy Recovery	Option 6.1: Mixed Waste Processing Facility Development.
	Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development.
	Option 6.3: Direct Combustion Facility Development.
	Option 6.4: Emerging Technologies Facility Development.
	Option 6.5: Organics Recycling Biocell or Biomodule.
	Option 6.6: Refuse Derived Fuel Facility Development.
	Option 6.7: Waste to Liquid Fuel Technologies Facility Development.
Residual Waste Disposal	Option 7.1: Landfill Expansion.
	Option 7.3: Bio-reactor Landfill.
	Option 7.5: Adjust Tipping Fees or Customer Base.
	Option 7.6: Purchase a New Landfill.

	Option 7.7a: Securing disposal capacity to preserve long-term landfill capacity at GLL.
	Option 7.7b: Securing disposal capacity for residual management following GLL reaching its approved disposal capacity.
	Option 7.8: Greenfield Landfill.
Overall System Considerations: Multi-residential Services	**Organics Management**
	Option 2.7: Community/Mid-Scale Composting.
	Option 5.1: On-site Organics Processing.
	Option 5.2: In-Sink Disposal Units.
	Waste Collection Methods
	Option 3.1: Container management.
	Option 9.1: Elimination of Collection Service to Multi-residential Buildings.
	Option 3.7: Multi-residential Collection using Alternative Vehicles.
	Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - Coloured bags
	Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum
	Planning, Policies and Enforcement
	Option 1.8. Mandatory Multi-residential By-law.
	Option 1.9. Updates to Current Multi-residential Development Standards.
Overall System Considerations: IC&I Services	Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market To Provide Diversion Opportunities to More Commercial Businesses in City of Toronto
	Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion
	Option 9.5: City of Toronto Exits the IC&I Waste Management Service.
Overall System Considerations: Construction, Renovation, Demolition Services	Option 10.1: Depots, Processing, and Policies to Divert CRD Waste
	Option 10.2: CRD Material Disposal Ban.
Overall System Considerations: Incentive-based Mechanisms	Option 9.8: Deposit-return System for City of Toronto for Selected Materials.
	Option 3.6: Incentive Based Drop-off System (e.g. reverse vending machines).
Control, Influence, & Enforcement	Option 9.7: City Explores Mechanisms to Introduce Additional Controls Over Waste Management – Bans, By-laws and Acts.

8.1.3 Phase 3: Application of Evaluation Criteria and Identification of Relative Scoring.

The defined evaluation criteria will be applied to estimate the potential impacts and opportunities of the specific option, and relative scoring will be applied to identify which options

"score" higher within a particular grouping of options addressing a common need. For example, the potential impacts to air will be identified and those options that help to reduce air emissions (and/or are less than other opportunities being identified) will be considered advantaged over other options that may have greater air emissions.

For each aspect being evaluated, options will receive a High, Medium or Low ranking based on the comparative analysis against the other options within the same grouping. The options with the ability to best meet the gap, challenge and/or opportunity will receive a High ranking and the option that least meets the gap, challenge and/or opportunity will receive a Low ranking. Although the use of a High, Medium and Low ranking system is qualitative, a quantitative approach will also be applied where a High is assigned a score of 3, a Medium a score of 2, and a Low a score of 1. These evaluations are then summarized for each individual option and then as a group of options.

A scoring guide was developed to provide consistency in applying the scores to each indicator. This scoring guide can be found in Appendix B.

8.1.4 Phase 4: Recommendation of Preferred Options.

Once the data has been collected, and the criteria have been applied, the options that have the highest "score" will be considered advantaged over the others and will be recommended for implementation. It is important to note that through this evaluation process, multiple options could be identified as preferred (i.e. options result in similar "scores") and in these circumstances, priority for implementation will be placed on those opportunities that are more advantaged over others (see Section 8.3 for more information on the priorities).

The preferred options will be those that exhibit the highest "score" and represent the preferred approach relative to the established gaps, challenges and/or opportunities. The ultimate recommendations on preferred options will also take into account the priorities of the community (discussed below) and in consideration of the options research completed, advice from technical experts and input received from stakeholders (i.e., Public Consultation Events, Surveys, Stakeholder Advisory Group Meetings, Key Stakeholder Meetings and other forms of public, agency and stakeholder engagement).

The evaluation process will conclude with a series of recommended options for implementation in the City of Toronto and have been identified as changes that either: a) have potential for improving the current system; or, b) will provide a potential replacement/ alternative/ substitute for a current component of the system. These options will be prioritized for implementation, based on the results of the evaluation, in Step 6 – Creating the Roadmap for Future System Implementation.

8.1.5 Modifications to the Evaluation Process as a Result of Consultation

Through the consultation process, feedback was received on the evaluation process. The following summarizes the feedback received that has resulted in recommended revisions to the originally identified process:

Feedback Received	Recommended Modification
Concern regarding having two different sets of criteria (one for Programs, the other for Facilities & Infrastructure) and the confusion this could cause with the public and stakeholders.	A common set of criteria will be applied to both Program Options and Facility & Infrastructure Options. Where criteria are not applicable to the options being evaluated an N/A will be marked.
Concern regarding some options being more about the "how" than the "what" and that some options could be removed from further consideration when they may be appropriate for implementation purposes depending on what is recommended.	Options identified that directly relate to either how a program or facility/infrastructure are implemented will be identified, summarized and carried forward as "Implementation Tools" to be considered where appropriate as part of the development of the implementation road map.

8.2 Evaluation Criteria

The following Table 8-2 contains the City Council approved evaluation criteria that have been applied to the options identified. The criteria have been organized under three categories that represent the three fundamental pillars of sustainability (Environmental, Social and Financial) and support a triple bottom line analysis of each option. Beside each criterion are sets of indicators, which are the specific considerations or measures that are proposed to be applied where appropriate to identify the potential effects related to the respective criterion. It is important that evaluation criteria are appropriate to the options being evaluated and therefore adjustments to the criteria and their application may be required depending on the option being evaluated. As presented in Table 8-3 below, there were a number of modifications to the criteria and indicators.

Table 8-2: Recommended Evaluation Criteria

Category	Criteria	Indicators
Environmental Impact/Benefit	Local Environmental Impact/Benefit	• Potential Impacts/Benefits to Land Resources • Potential Impacts to Local Airshed • Potential Impacts to Local Water Sources • Potential Water Consumption Requirements

Category	Criteria	Indicators
		• Total Land Required and Land Use Displacement
	Regional/Global Environmental Impact/Benefit	• Energy and Fossil Fuel Generation / Consumption • Greenhouse Gas Contributions
	Public Health Impact/Benefit	• Potential to Impact Human Health • Potential to Impact Ecological health
	Potential to Increase Diversion	• Ability to Recover Additional Reusable and/or Recyclable Materials
	Waste Hierarchy	• Consistency with the Priorities of the Waste Hierarchy
Social Impact/Benefit	Approvals Complexity	• Complexity Associated with Approvals and Permitting Requirements
	Potential for Land Use Conflicts/Community Interruption	• Potential for Traffic Increase/ Reduction • Potential for Litter Increase/ Reduction • Potential Odour Emissions • Potential Noise Emissions • Potential for Increased Vector/Vermin
	Collaboration	• Ability to Partner with other Municipalities/ Organizations
	Complexity	• Program Complexity to User
	Convenience	• Ease of Participation
	Community Safety	• Potential for Impacts to Community Safety
	Equity	• Potential for Unequal Impacts/Benefits to Specific Groups
	Behaviour Change *	• Potential to Influence or Encourage Behaviour Resulting in Sustainable Waste Reduction Choices
Financial Impact/Benefit	Cost	• Estimated Net Capital Cost • Estimated Net Operating Cost
	Health Care Cost Implications*	• Potential to Increase Health Care Costs
	Risk	• Potential for Contractual Risk • Schedule Risk • Innovation Risk
	Economic Growth	• Potential for Local Economic Growth

Category	Criteria	Indicators
		• Potential for Regional/Global Economic Growth
	Local Job Creation*	• Potential for Additional Local Job Creation
	Flexibility	• Ability to Accommodate Future Changes (e.g. regulation, waste composition, etc.)

* New Criteria based on feedback received through Phase 2 consultation and/or Council direction

8.2.1 Modifications to Evaluation Criteria as a Result of Consultation

Through the consultation process, feedback was received on the evaluation criteria which has resulted in enhancements to the criteria originally proposed. The following summarizes the feedback received that has resulted in changes to the evaluation criteria:

Table 8-3: Modifications to Evaluation Criteria

Feedback Received	Recommended Modification
A comment was provided that similar to energy generation/consumption, the potential water consumption need of some options should also be evaluated.	Potential Water Consumption Requirements has been added as a consideration when evaluating Local Environmental Impact/Benefit.
Comments were made about the difference between innovation and risk and that more innovative technologies are inherently higher risk.	Innovation has been removed as a criterion and will be addressed as an indicator along with other risk based criteria.
Comments were received about how public safety would be addressed in the evaluation.	Community Safety has been added as a criterion for evaluation.
Comments were received about consolidating and/or grouping some of the criteria originally proposed.	Some of the criteria have been grouped together. For example, Capital and Operating Cost criteria have been grouped under a new criterion of Cost. This change will not impact the extent of the evaluation to be completed, but rather is being done to simplify how the results will be presented in the future.
Nutrient recycling benefits should be included in the evaluation	The environmental indicator "Potential Contaminants to Land Resources" has been modified to "Potential Impacts/Benefits to Land Resources".
Comments were received about the	A new criterion has been added under Social

Feedback Received	Recommended Modification
importance of social equity within the City	called "Equity" which will be applied to understand if the proposed option has a different impact/benefit on different groups within the City.
A comment was provided with respect to setting thresholds for each of the criteria.	For a planning study at this stage and given the range of options to be evaluated, the establishment of thresholds would be very subjective and potentially overly restrictive resulting in some options being removed from further evaluation, when in fact they should be considered. However, there are some thresholds which are already in place and would be included/assumed (e.g. regulatory thresholds for air emissions would be assumed as mandatory requirements and any option not meeting these requirements would not be considered further).
At the September 22, 2015 PWIC meeting, City staff were directed to include an additional criterion.	A new criterion has been added under Social called "Behaviour Change" which will be applied to understand if the proposed option has potential to influence or encourage behaviour resulting in sustainable waste reduction choices.
At the September 30, 2015 Council meeting, City staff were directed to include two more criteria.	A new criterion has been added under Social called "Local Job Creation" which will be applied to understand if the proposed option has potential to create local jobs. A second criterion has been added under Financial called "Health Care Cost Implications" which will be applied to understand if the proposed option has potential to increase health care costs.

8.3 Priorities in the Evaluation

It is also important that the relative importance of each category and criteria is understood and factored into the evaluation. As part of the Phase 2 consultation process, input was sought on where priority should be placed in the overall option evaluation process. This will be important in situations where two options are being evaluated that overall may result in a similar ranking however, the score that add up to that ranking are coming from different categories or criteria.

The following provides a simple example of two hypothetical evaluations and how the use of priorities is important.

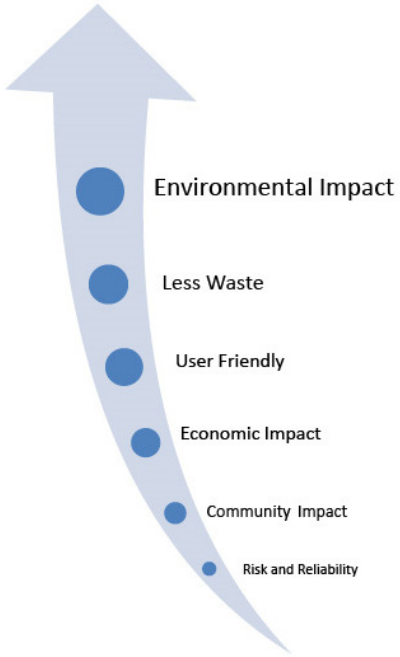
Option #1	Option #2
Environmental – HIGH (3)	Environmental – LOW (1)
Social – MEDIUM (2)	Social – MEDIUM (2)
Cost – LOW (1)	Cost – HIGH (3)
Overall – MEDIUM (2)	**Overall - MEDIUM (2)**

Both of these scenarios result in an overall **MEDIUM** ranking and therefore would be considered equal. However, if it is determined that priority should be placed on environmental considerations over financial considerations, Opportunity #1 would be preferred as it received a HIGH (3) score whereas Option #2 received a LOW (1) score under the environmental category.

As part of the Phase 2 consultation process, a survey was developed (Survey #3) to get feedback on the priorities for the Waste Strategy. Participants were presented with the following six priorities in random order and were asked to select their top five priorities for the Waste Strategy:

- Environmental impact;
- Produce less waste;
- Community impact;
- User friendly;
- Economic impact; and
- Risk and reliability.

Figure 8-1: Survey #3 - Average Ranking of Priorities



Feedback on the priorities was solicited through Public Information Centres and Key Stakeholder Meetings. Overall, respondents generally expressed that environmental criteria should be given the most priority when making decisions about waste management programs.

Based on the input received through the Phase 2 consultation process, the following priorities will be applied in the order presented below in the options evaluation process.

1. Environmental
2. Social
3. Financial

Further information about the Phase 2 Consultation process can be found on the City's website[13].

8.4 Involvement of Toronto Public Health in Evaluation

To support in the application of health based criteria, Toronto Public Health (TPH) officials were engaged at the request of Solid Waste Management Services in October 2015. TPH was asked to lead the evaluation of public health impacts and health care costs for the 43 waste management options by applying a public health lens to each option.

TPH conducted an analysis of the waste management options using a rapid Health Impact Assessment (HIA). The objective of the rapid HIA was to evaluate the options from a public health and equity perspective, and specifically, to provide an assessment for each option for the following two criteria:

1. Public Health Impact (i.e. potential to have an adverse or beneficial impact on human health)
2. Health Care Cost Implications (i.e. potential to increase or reduce health care costs).

The assessments from the rapid HIA process were then integrated into the following indicators in the Waste Strategy's assessment:

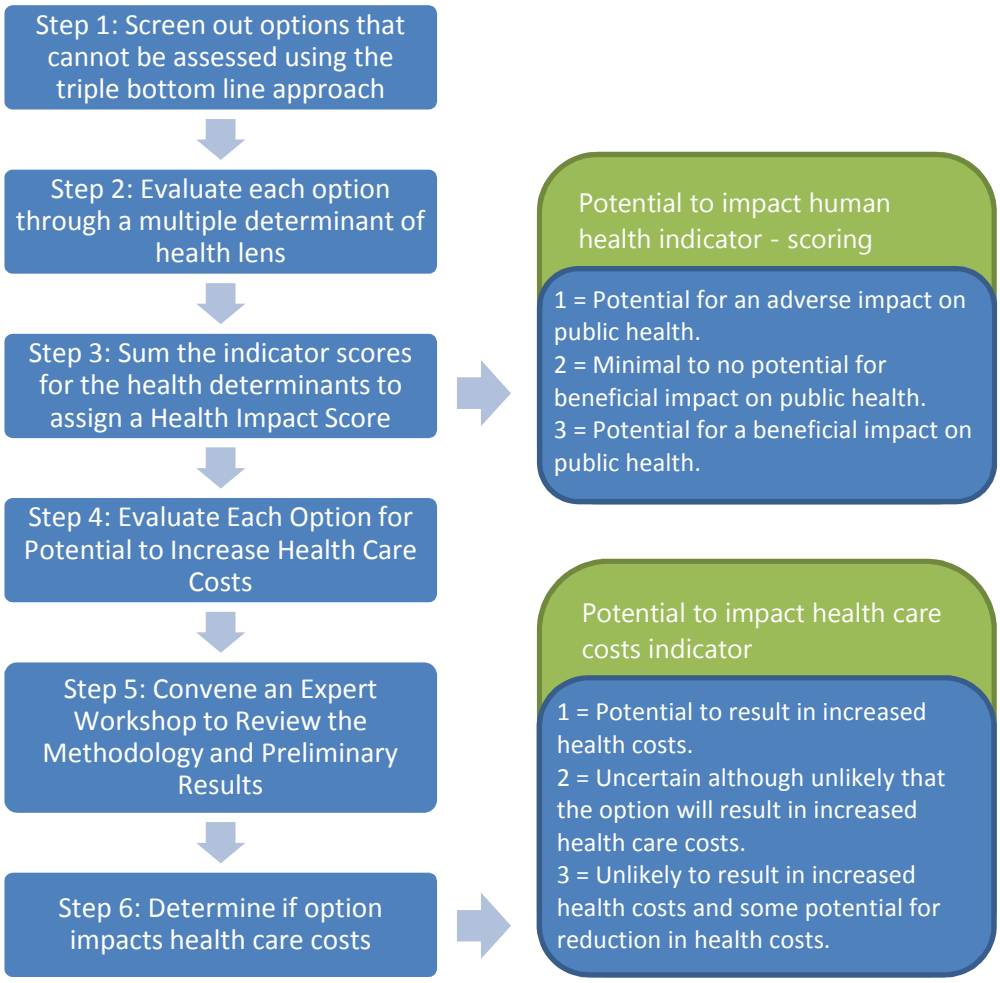
- Public Health Criteria (included in the broader category of Environmental Impact/Benefit); and,
- Potential to Increase Health Care Costs (included in the Financial Impact/Benefit).

The following figure provides a brief overview of the process utilized by TPH and the expert panel convened by TPH to support this project. For a detailed description of the TPH methodology and assessment of options, please see **Appendix C** to this Technical Memorandum.

Figure 8-2 summarizes the steps to complete this process and the resulting definitions for scoring each indicator.

[13] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

Figure 8-2: Summary of HIA and Scoring Process



9 Next Steps

Now that a list of potential options has been established, a more detailed evaluation of each opportunity will be completed. The detailed evaluation of the list of options is Step 4 in the process and will be documented in the next Technical Memorandum to be prepared entitled "*Technical Memorandum #4 – Detailed Evaluation of Options*".